

Unleashing Demand Response with Effective Supplier Compensation

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Explicit demand response, where aggregators enable small commercial and domestic consumers to participate directly in the wholesale market by flexing their demand, is a vital resource in the transition to a sustainable electricity system.¹ However, barriers to the successful development of this vital resource exist in many Member States, including the need for aggregators to obtain permission from the customer's supplier and to compensate the supplier for lost income.² The level of compensation is normally a matter for negotiation between aggregator and supplier, although France has an administered arrangement that removes the need for negotiation. In some Member States (e.g., Great Britain), no compensation is required.

Article 17 of the proposed Electricity Directive harmonises the situation across Europe, ending the requirement for an aggregator to obtain permission to operate on the consumer's demand or to compensate the consumer's supplier (other than in some imbalance-related "exceptional circumstances"). In its current form, Article 17 removes a significant barrier to the development of explicit demand response and the enhanced customer market participation and flexibility so necessary to a cost-effective transition to a low carbon electricity system.

However, incumbent suppliers continue to seek compensation from aggregators, maintaining that energy the incumbents buy up front is transferred to aggregators free of charge who then profit by selling it on, leaving suppliers unable to bill customers for unused energy. This is in fact not the case. Although it is true that suppliers cannot bill for unused energy, in providing downward demand response aggregators simply reduce the amount of energy consumed and,

¹ The term "explicit" or "incentivised" demand response is used to describe the situation where customers flex their energy consumption in response to some payment from a third party. Situations where customers simply flex their consumption in response to variations in retail energy prices (i.e., via a dynamic energy tariff) is referred to as "implicit" or "price-based" demand response.

² This policy brief restricts itself to considering the justification for compensation in the case of "downward" demand response. Upwards demand response raises a series of symmetrical arguments for compensation, if justified, to flow in the opposite direction (i.e., from suppliers to aggregators). However, in the interests of simplicity, these arguments are not addressed here.

therefore, generated. Energy is not sold on; it is neither consumed nor generated.

This policy brief explains the process by which aggregators offer demand flexibility to the market—both the physical reality and the market transaction. The brief also recommends an alternative to aggregator-to-supplier compensation, and describes the essentials of a similar debate held in the United States and how that debate concluded.

The value of demand response and the need for aggregation

Many studies describe the potentially huge financial benefits of demand response. A study undertaken by RAP suggests that, even with the generally depressed wholesale energy prices seen in recent years, savings accrued by even a modest application of demand response across the French, German/Austrian, and Nordic markets could exceed 1.6 billion Euro annually.³ Furthermore, as the vision set out in the Commission's Winter Package becomes reality, with the wholesale electricity supply becoming more variable and energy prices more fully reflective of real-time shifts in the balance between supply and demand, the value of demand response should increase significantly.

The current market opportunity for demand response can mostly be served by industrial and large commercial customers. However, as the value of and need for flexibility grows, there will be value in mobilising smaller commercial and eventually domestic customers to meet that need. As the domestic sector makes up approximately one third of all demand and even more in high-value periods, we will benefit from domestic customers playing their part. It is also worth noting that the domestic sector is ideally placed to provide the local flexibility services that will be required to manage local network constraints and ensure that electrification in the heat and transport sectors can be integrated in the most cost-efficient fashion.

Despite these advantages, the business case for individual domestic customers to provide explicit demand response is challenging, given communication and hardware costs and the very limited flexibility that any one domestic consumer can provide. This is why we need to remove barriers to the development of aggregation services. The alternative is for individual domestic customers to simply respond to price signals via dynamic or time-of-use energy tariffs (i.e., implicit or priced-based demand response), and many customers may choose this path. However, these tariffs come with risks and complexities that many individual consumers may find unattractive. With aggregation and explicit demand response, the aggregator can effectively manage those risks and complexities as a service to those consumers, thereby increasing participation and the amount of demand response available.

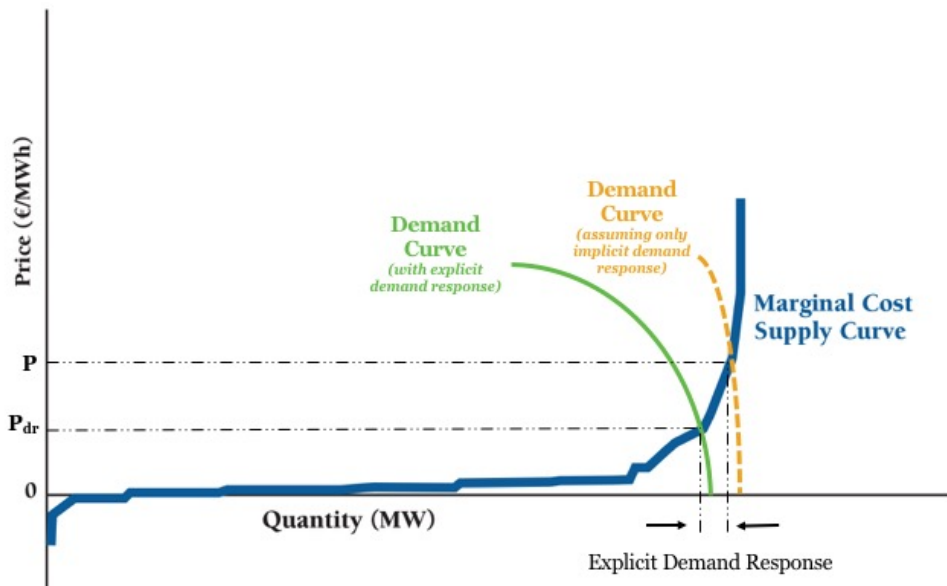
The societal benefit of demand response

When cost-effectively applied, demand response can lead to significant societal benefit through the reduction of wholesale market prices. When the supply-demand balance is tight, even modest reductions in demand can avoid the need to run high marginal-cost generation or avoid other even more costly measures, reducing market clearing prices as illustrated in Figure 1. This

³ Baker, P. (2016). *Benefiting Customers While Compensating Suppliers: Getting Supplier Compensation Right*. Brussels: Regulatory Assistance Project. Available at: <https://regulatoryassistance.sharepoint.com/europe/Supplier-compensation/Shared Documents/baker-benefiting-customers-compensating-suppliers-2016-oct.pdf>

allows suppliers to make significant savings when buying energy for their customers, and one would expect that most of these savings will make their way to customers through competitive or, where necessary, regulatory pressure. The point to note here is that **all** customers benefit from cost-competitive demand response, not just those customers who reduce their demand—a genuine societal benefit in lower wholesale and retail energy prices and avoidance of uneconomic investment.

Figure 1. Explicit Demand Response Reduces Wholesale Electricity Prices



What service is the aggregator selling?

The supplier community contends that in offering downward explicit demand response, aggregators take energy purchased by suppliers in anticipation of their customers' needs and re-sell it to the market. Their objection relies on the pretense that this is energy that the supplier purchases, is generated, and is delivered, from whence it is resold by the aggregator. In reality however, energy is not consumed and is therefore neither generated nor delivered. The aggregator simply enables the suppliers' customers to reduce their demand and offer a product to the market that removes the need to generate an equivalent amount of energy. As no more energy can be generated than is consumed, the aggregator's product reduces the amount of energy generated and hence market costs. No energy is transferred. It is simply not used.

The second part of the supplier's contention is certainly true: customers cannot be billed for energy they did not consume. In the case where customers simply reduce their consumption in response to price signals delivered through a time-of-use or dynamic tariff (price-based or incentivised demand response), there is no suggestion that those customers should compensate the supplier for loss of revenue. However, requiring aggregators to compensate suppliers for lost revenue essentially amounts to the same thing. Unlike implicit demand response, explicit demand response is purchased on the market. In seeking compensation, suppliers are attempting to charge aggregators (and indirectly, aggregators' customers) for something that they rightly cannot charge customers who have reduced their energy consumption on their own. In doing so, they are ignoring the very significant benefits that both implicit and explicit demand response brings in the form of reduced energy prices.

What service is the supplier providing?

Suppliers effectively link the wholesale and retail markets, buying energy in bulk in anticipation of their customers' actual energy consumption. By buying energy in advance, suppliers can set retail tariffs and manage procurement risks. Customers on flat tariffs have no obligation to use the energy purchased on their behalf, and therefore are under no obligation to pay if they decide not to consume—they are effectively provided a “hedge” or option by the supplier buying energy in advance. In other words, by buying energy in advance, the supplier is hedging its exposure to the option it provides to flat-tariff customers to consume as little (or as much) energy at the tariff rate as they wish. Such customers can contract with an aggregator to offer their “non-consumption” to the market, thereby allowing those customers to realize some of the benefits of participating in the market without the attendant risks and complexities of time-of-use pricing.

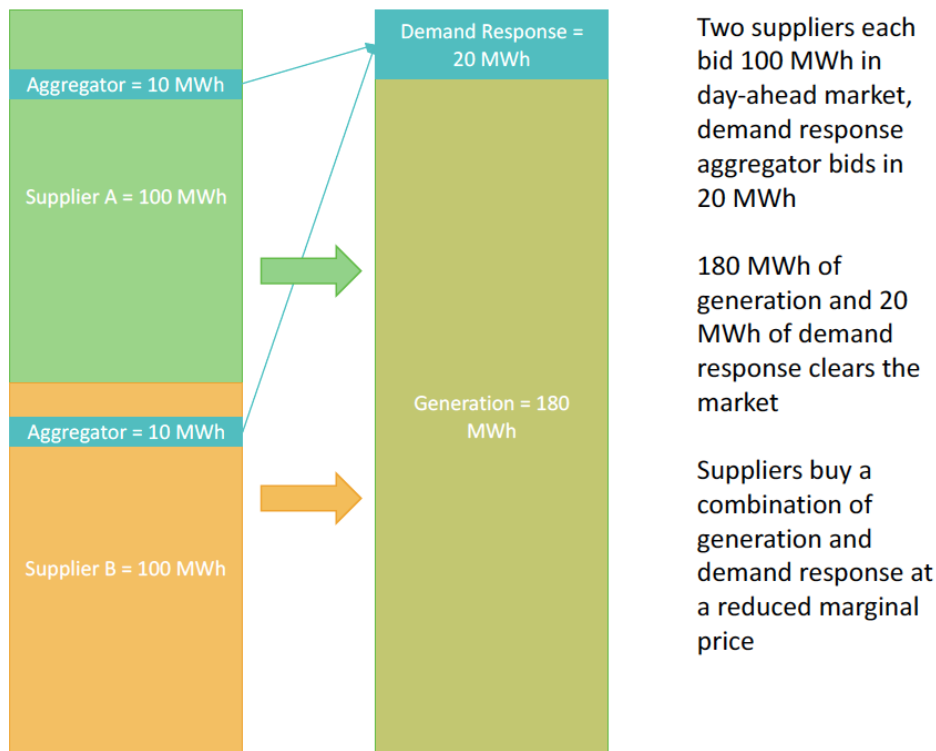
How does the market value demand response?

Whereas the practical reality is that aggregation or explicit demand response simply reduces the amount of energy consumed and generated, the market treats explicit demand response rather differently. Making the simplifying assumption that all energy is bought and sold at the day-ahead stage (it clearly isn't, but the assumption makes no real difference to the argument), Figure 2 shows that when demand response is in play a supplier is buying a combination of generated energy and demand response. As the day-ahead market is anonymous, the supplier is not aware of what is being bought—generated energy or demand response—or whom he is buying from, but sees the benefit of demand response in the form of a reduction in the wholesale clearing price.⁴ The market, therefore, makes no distinction between energy that is generated and energy that is not generated. Both receive the market clearing price; however, the clearing price with demand response in play is lower than it would be if demand response did not take place.

If a supplier's customers are not involved in the aggregator's offer that clears the market, then that supplier sees only a benefit (i.e., the reduced wholesale price). If, on the other hand, that supplier's customers are involved in providing demand response, the supplier may see both benefits and costs—the benefit of lower wholesale prices but also the costs associated with energy that is not consumed and therefore cannot be billed. This may seem to place some suppliers at a competitive disadvantage compared with others, possibly suggesting the need for compensation between suppliers. It does not, however, make a case for aggregators compensating suppliers for energy that has neither been consumed nor generated.

⁴ The reduction in clearing price is brought about by demand response replacing more expensive generated energy and is likely to be significant when capacity is scarce, as illustrated in Figure 1.

Figure 2. Market Valuation of Demand Response



Does aggregation unbalance a supplier's contractual position?

An argument frequently made is that when customers reduce demand in order to bid into the market via an aggregator it will result in the customer's supplier incurring imbalance charges. But this is not always the case.

In some Member States, a supplier's contractual position as notified at gate closure is automatically adjusted to reflect the actions of an aggregator on the customer's demand; this is sometimes referred to as the "corrected model."

In those jurisdictions where the corrected model is not in place, the aggregator's action will unbalance the supplier's position, with the supplier having to "spill" any excess energy into the balancing market. This would not necessarily be to the supplier's disadvantage, as the imbalance price is likely to be high when demand response is in play and the supplier could well receive more for the spilled energy than was originally paid. However, Article 49 of the recently approved regulation establishing guidelines on energy balancing requires Member States to ensure that an "imbalance adjustment" is applied to a supplier's balance position to account for all activated balancing energy bids.⁵ Once the regulation is implemented, we should revert to the position described in the previous paragraph with the aggregator's action having little or no impact on the balance position of the supplier, with the possible exception of when balancing services are offered outside the balancing market.

⁵ Regulation establishing guidelines on electricity balancing—see:

https://www.entsoe.eu/Documents/Network%20codes%20documents/NC%20EB/Informal_Service_Level_EBGL_16-03-2017_Final.pdf

Where an aggregator offers demand response via the balancing market rather than to the day-ahead or intra-day markets, a slightly different situation arises. In this case, there is no direct impact on wholesale market prices and only those parties who have an imbalance will benefit from the reduction in imbalance price brought about by an acceptance of a demand response offer. However, in addition to paying less for energy in the balancing market, suppliers with a positive imbalance (i.e., when out-turn demand exceeds that declared at gate closure) will be able to bill customers for the additional energy consumed—energy that would not have been bought in advance.

An alternative to aggregator-to-supplier compensation

An alternative method of ensuring that suppliers can recover costs they feel they have incurred, without risking the viability of cost-effective, explicit demand response and aggregation services, would be for suppliers to simply retain a small proportion of the wholesale market savings. In all practical circumstances, those savings will always exceed and often dwarf any income lost by suppliers due to customers opting not to consume, and will offer a ready source of net revenue from which to cover any such loss.

Relying on the retention of some of these wholesale market savings to ensure that suppliers remain financially whole, rather than via negotiated or administered compensation, is both a pragmatic and just solution. The alternative of direct compensation proposed by suppliers will severely curtail the deployment of explicit demand response, resulting in fewer benefits to be enjoyed. In addition, as the reduction in wholesale energy prices brought about by demand response should be enjoyed by *all* customers via lower retail tariffs, it seems appropriate that *all* customers should share in the associated costs. Furthermore, while not being a particularly elegant solution in economic terms in that it ignores the option value provided by suppliers, it has the virtue of simplicity. There is no need for negotiation between aggregators and suppliers, nor any need to make the difficult assumptions necessary in establishing an administered alternative to negotiation with the attendant risks of over or under compensation.

A similar debate in the United States

The debate in the United States concerned the Federal Energy Regulatory Commission's (FERC) Order No 745, which required market operators to pay the same wholesale price to providers of demand response as is paid to generators—essentially the same situation as exists in European markets today. Order 745 was adopted in preference to an alternative compensation scheme proposed by the Electricity Power Supply Association (EPSA) that would have subtracted from the wholesale price the savings made by customers in not consuming energy. The EPSA remedy is similar, if not the same, to the supplier compensation proposal in Europe in that the aggregator would retain the wholesale price minus the retail price of the unused energy. Order 745 eventually came before the United States Supreme Court which concluded that deciding the terms on which demand response should be remunerated was a matter for FERC and not for them. Thus, the situation in the United States and Europe (based on the wording of Article 17 of the proposed Directive) will essentially be the same—demand response will be rewarded at the wholesale market clearing price with no discount or compensation applied.

Although the Supreme Court did not express an opinion on the technical merits of the

remuneration provided in Order No 745, it is instructive to note some of the arguments deployed by FERC to justify its position. Firstly, FERC considered that, as the acceptance of a demand response and an equivalent generation offer would have the same impact on the wholesale market price, they should both receive the same value from the market. Secondly, although they do not inquire into the costs incurred by a market participant when making an offer to the market, FERC noted that the cost structure of different providers could be very different. While a generator would need to recover the cost of fuel, a demand response provider may need to recover significant upfront hardware costs.

It is also interesting to note that Order No 745 contains a “net-benefit” test to ensure that a demand response provider will only receive full market value if there is an overall benefit to consumers. If there is a concern that the Commission’s “no compensation” position set out in Article 17 of the proposed directive could lead to excessive demand response deployment due to aggregators being over-rewarded, then this is a precaution that the Commission may want to consider adding to the process.

Conclusions

Demand response, both explicit and implicit, offers real benefits in terms of reduced wholesale electricity prices for all consumers—not just to participants. Explicit demand response has the additional advantage of allowing domestic and small commercial customers a risk-free route to the market that leverages the value of a portfolio of small loads while reducing the risks and costs of participation.

Aggregated explicit demand response does not involve the transfer of energy from suppliers; it just reduces energy consumption and therefore the energy that needs to be generated. However, aggregators and consumers providing demand response do take advantage of the “hedge” that arises from suppliers purchasing energy up-front.

Suppliers see the benefit of demand response as a reduction in the cost of the energy they need to buy for all their customers. If suppliers are unable to avoid some associated costs, they have ample opportunity to “self-compensate” by retaining some of those savings in energy purchasing costs. However, it is possible that some suppliers may be placed at a competitive disadvantage in the early stages of explicit demand response development by having a disproportionate share of their customers participate in third-party aggregation. This is an issue that can be addressed specifically through provisions for compensation between suppliers, rather than a broad remedy that needlessly undermines the business case for empowering domestic and small commercial consumers.

For these reasons, Article 17 of the proposed Electricity Directive as written should be supported. In its current form, Article 17 removes a significant barrier to the development of explicit demand response and the enhanced customer market participation and flexibility so necessary to a cost-effective transition to a low carbon electricity system. Any modification of the current wording that requires aggregators to compensate suppliers for income associated with energy not consumed would undermine these aims. However, if there are concerns that a “no-compensation” position could potentially result in the overuse of explicit demand response, the Commission may want to consider the need for a “net benefit” test as applied by FERC in the United States.



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